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PUBLIC  
LIVESTOCK HEALTH PROGRAMS

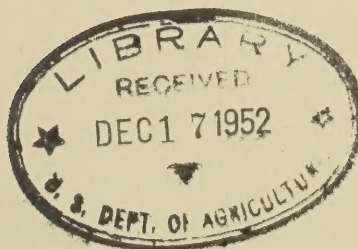
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A study of Extension Service programs and activities  
as promoted in the various States in cooperation with  
other agencies, Federal, State, and local.

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To those many individuals with whom I had contacts at the Extension Service and the Bureau of Animal Industry at Washington, and to those in the States who so generously gave of their time to supply information, my most sincere thanks are expressed. Without this kind and willing assistance this study could not have been made.

*Cherna F. Brady*

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PUBLIC LIVESTOCK HEALTH

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Purpose

- (1) To study public livestock health programs in the various States under conditions prevailing in those States and with particular reference to the problem of brucellosis.
- (2) To study the goals set for these programs as based upon the local situation and the needs of those affected.



## PUBLIC LIVESTOCK HEALTH

Keeping the Nation's livestock healthy and producing is a major task. Livestock owners, their veterinarians, research pathologists, extension teachers, and regulatory officials are jointly weighted with the responsibility of protecting the country's animals from harmful and destructive ailments. To say that the producer alone must bear this burden is hardly fair, even though he, in our free society, owns the animals "for better or for worse," profit or for loss. The fact that disease does not always stay put within the confines of the corral or barnyard fence, but may spread to other flocks and herds, with damage to the neighbor and perhaps the public, places a share of the obligation for keeping farm livestock healthy upon the shoulders of all citizens.

Livestock health, in many respects like human health, needs public support. The stakes are too great to think otherwise. Human health will suffer if livestock diseases are ignored. The Nation's food supply is endangered; and livestock farming, one of the solid foundations of our advanced civilization, could conceivably fade into oblivion if livestock diseases are allowed to go untrammelled and uncontrolled. With the disappearance of livestock from our farms or with a decrease in its productiveness of milk, meat, eggs, and the other products too numerous to list, human diets suffer and our high living standards decline.

It is with this background and need, that this study of public livestock health programs in the different States has been undertaken.

### OUTLINE OF STUDY PLAN FOR SABBATICAL LEAVE

#### Situation:

Success with livestock production in New York State and in the United States in large measure depends upon keeping farm livestock healthy. Human Health, too, in some respects is associated with the health of the animals with which people have contact and from which their food is derived. At present, brucellosis in humans and in cattle, goats, and swine is one problem of national concern. How to guard against these animal diseases transmissible to man and how to save the vast livestock industry from those losses incident to ill health is the responsibility of livestock owners, veterinarians, and public agencies, local, State, and Federal. Sound programs, sympathetically yet firmly administered, are needed. In addition, public livestock health education is the prerequisite for successful results.

#### Purposes:

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- (2) To study the goals set for these programs as based upon the local situation and the needs of those affected.



- (3) To study the educational methods in use and to evaluate as accurately as possible the progress gained and the results already achieved.
- (4) To study the relationships existing between the parties and agencies entrusted with the program's development and operation.

#### Study Plan:

In approaching a project of this kind, which to our knowledge has not been completely explored before, advice from the Extension Service and the Bureau of Animal Industry has been sought. U. S. Department of Agriculture consultants from whom we have received aid and encouragement to proceed with this study are:

Mr. Cannon C. Hearne, Mr. Charles Potter, and Dr. C. D. Lowe, of the Extension Service; and Dr. B. T. Simms, Dr. A. K. Kuttler, and Dr. Asa Winter, of the Bureau of Animal Industry.

At the State level, the counsel of the following has been asked: Director of Extension, L. R. Simons; Dr. W. A. Hagan, Dean, New York State Veterinary College; Dr. K. L. Turk and Professor S. J. Brownell, of the Department of Animal Husbandry at Cornell; and Dr. E. V. Moore, Assistant Commissioner of Agriculture of New York State.

Mr. W. D. Knox, editor of *Hoard's Dairyman* and secretary of the National Brucellosis Committee, is particularly interested in our proposed plans, he says. Mr. Knox is also chairman of the Herd Health Committee of the American Dairy Science Association.

The plan which we propose combines resident with travel study. The first few weeks of this sabbatical leave will be spent at the Department of Agriculture at Washington. Office space has been offered. The State and Federal reports of the Extension Service and the Bureau of Animal Industry, I am told, will be accessible. Library facilities are extensive. Acquaintance with and assistance from Department personnel will be exceedingly beneficial.

Emphasis will be placed upon securing a broader knowledge of the livestock health problems, their backgrounds and causes, and the methods employed to meet them. Relationships between livestock producers, veterinarians, boards of health, extension workers, and livestock sanitary officials will be delved into. Problems similar to those in our own State of New York will be looked for and given particular attention, since we are seeking to learn from the knowledge of others how we may improve our programs and extension teaching methods. Incidentally, we hope that from our own experience we may be reciprocally helpful to others with their problems.

For a program of this nature and scope to be most productive of results, contacts must be made in the field. This is being planned to follow my weeks of research at Washington in the Department of Agriculture. It is expected that I shall visit those States where excellent livestock health programs are in effect. Conversely, I should like to make a contact with those areas where programs are lagging.



The views of those who know the facts about local conditions and problems will be sought. Extension specialists and livestock sanitary officials in these States will be interviewed. County agents, veterinarians, and farmers are in a position to supply valuable data. It is the field portion of this study program that offers the greatest source of basic information, in my opinion.

#### Results Expected:

The last month of my sabbatic, I expect to spend summarizing the work and analyzing the data for the preparation of a final report.

Since a similar study of public livestock health programs has not been made previously, our conviction is that the gathered facts with their interpretation will be exceedingly valuable to all students of the subject. Administrators in the fields of human and livestock health will be interested in the findings. Teachers of students and extension workers can use the data in their work of education. In many ways and in many fields, the results from this study should be useful.

We hope that others, encouraged by this preliminary effort of ours, may be stimulated to seek further knowledge through a continuation of this work. Healthy livestock is a national asset which must be protected and guarded. People who want to be healthy and properly nourished, and farmers depending upon livestock for their livelihood, all rely upon this asset's preservation. It is our wish that what we have planned to do in the 6 months' period ahead, will be an aid in this direction as the future unfolds.



STATES VISITED

State	Who Was Seen			
	Extension specialists	College re- sident staff	Federal BAI inspectors	State Veterinarians
Massachusetts	x	x		x
New York			x	x
New Jersey	x	x	x	x
North Carolina	x	x	x	x
Ohio	x	x	x	x
Indiana	x	x	x	x
Kansas	x	x	x	x
Wisconsin	x	x	x	x
Michigan	x	x	x	x
Tennessee (Middle Tennessee State College)		x		
Florida	x			x
Alabama	x	x		x
Kentucky	x	x		
Iowa	x	x	x	x
Nebraska	x	x	x	x
Colorado	x	x	x	x
California	x	x	x	x
Oregon	x	x	x	x
Washington	x	x	x	x
Idaho		x		
Montana	x	x	x	x
North Dakota	x	x	x	x
Minnesota	x	x	x	x
Pennsylvania	x	x		



### EXTENSION HEALTH PROGRAMS

In a review of the Extension Service reports from 47 States, it was learned that in every State some health work is under way in connection with the dairy and livestock programs. In some States the health activities are treated under the headings of management and sanitation or as problems of calf rearing. In most States, however, more specific statements are made concerning the diseases of greatest concern, such as brucellosis or mastitis or hog cholera. Some dairy specialists not listing "health" as a program activity mention that they are cooperating with the extension veterinarian if one is employed, or with the State and Federal bureaus of animal industry on the established disease control programs in the State.

In no instance is it mentioned in the reports that the maintenance of healthy livestock falls outside the scope of the educational activities of the Extension Service. However, it is very evident that specialists in no way intend to invade the field of the veterinarian in the conduct of their activities. The local veterinarian is viewed as an essential person whose professional knowledge and counsel should be frequently sought and utilized in the best interests of the program and the livestock industry. It was learned that where the Extension Service personnel, the veterinary profession, and the State and Federal animal industry bureaus are cooperating harmoniously and without friction and petty jealousies, the livestock health programs appear to be making the greatest progress.

### Disease Prevention Stressed

One of the points noted throughout this study is the frequent mention of "disease prevention." Though it is stated that livestock owners often are basically more interested in "cures" and "remedies," it is the prevention of disease losses that pays greatest dividends in the long run. It is in this field of prevention that extension workers trained in animal husbandry and dairy management find their greatest opportunities as teachers and educators.

There are many management practices, the State specialists' reports indicated, that have a direct bearing upon the health of animals. Proper nutrition, for instance, is frequently listed under the broad heading of "Health." Right housing, also, has a relationship not to be ignored when formulating health programs. There are numerous practices of management and sanitation, and even of breeding and selection, that are placed in the health section of the dairy and livestock program.

Protecting the healthy, and by far the big majority of farm animals are healthy, is the big task confronting the livestock industry of this country. Of course, the desire to treat and cure disease after it strikes should not be minimized, but emphasis put upon treatments alone is the short-sighted approach. The need for treatments follows the time when losses begin to be recognized. Their use is like "locking the barn door after the horse is stolen." Extension workers, in their programs, chiefly direct their activities toward helping the farmers avoid troubles from livestock health problems. Emphasis placed upon practices of good feeding, right management, proper breeding and selection, comfortable housing, and strict sanitation, is what is receiving most attention in the majority of States.



### Some Health Problems

The programs and plans of work from the various States that were studied listed many disease problems of economic importance. Brucellosis was mentioned most often in the reports as a major problem. Thirty-nine States referred to brucellosis as a disease requiring immediate action.

Thirty-five States listed mastitis as a problem of major significance to the dairy industry. Parasites, both external and internal, were cited by 23 States as a cause of great monetary loss to the cattle, sheep, and hog industries.

Breeding troubles and sterility problems appeared in 14 programs as problems requiring attention. Calf diseases were mentioned by 13 States.

Vibrio fetus was recognized as a problem in sheep, in California, and in cattle, in Connecticut, New Hampshire, Vermont, New York, and Oregon. Tuberculosis was mentioned as still needing attention if it is to be kept under control, in Arizona, Delaware, Indiana, Louisiana, Missouri, Oklahoma, Utah, and Vermont.

Nutritional "diseases" were cited as problems in California, Colorado, Montana, New Mexico, North Dakota, and Texas, and foot rot appeared to be a significant cause of loss in New York, Colorado, and New Jersey. Poisonous plants were said to be troublesome in Colorado and New Mexico. The effect of ergot in grains and on grasses on milk production and on the health of cattle was reported needing further research in Montana.

Other livestock health problems mentioned as causing losses were milk fever, ketosis, blackleg, anthrax, anaplasmosis, lumpy jaw, John's disease, X-disease, brisket disease, urinary calculi, shipping fever, pinkeye, rabies, "pine-needle" abortion, and Q-fever.

As hog diseases, the following were reported: Brucellosis, hog cholera, atrophic rhinitis, vascular exanthema (in garbage-fed hogs on west coast), and swine erysipelas. Sheep diseases listed by a few States were: listerellosis, enterotoxemia, and Q-fever.

Additional research in the control and prevention of some of these livestock problems affecting the health of animals was said to be badly needed since the causes of all these diseases are not fully known.

### BRUCELLOSIS, THE MAJOR DISEASE

In this study of public livestock health programs, brucellosis in cattle, swine, and goats is looked upon by most States as the number one problem. Its economic significance to the livestock industry is one aspect, and its relationship to human health is another that cannot be ignored. To wipe out human brucellosis, authorities say, brucellosis in livestock must first be subdued.



Boards of health are beginning to take cognizance of this assertion by drafting ordinances that require milk to come from brucellosis-free animals. The Chicago regulation effective January 1, 1955, is an illustration.

North Carolina has a similar regulation, which becomes operative July 1, 1952. Oregon likewise, has a rule that went into effect August 2, 1951. Montana law says all grade A milk after January 1, 1954, shall come from brucellosis-free herds.

The city of Pittsburgh now has a regulation giving its milk producers until September 1, 1952, to put their herds under one of the State plans of brucellosis control requiring herd testing.

In spite of these rulings, in many States dairy farmers are getting their herds in shape to comply. The official State and Federal plans for brucellosis elimination are providing producers with the means by which they can remove this disease intruder from their premises. Already, thousands of dairy herds, and beef herds, too, have been tested and found free. This survey covering 23 States verifies this fact. Brucellosis is on its way out. Yet there are many States still far from their goal, if eradication is that goal.

#### The Federal B.A.I. Plan

Let us examine some of the plans for brucellosis control and eventual elimination. This is the program of the U. S. Bureau of Animal Industry, approved and recommended by the U. S. Livestock Sanitary Association and the National Brucellosis Committee:

- Plan A. Test and remove reactors for slaughter with or without indemnities.
- Plan B. Test and retain reactors; vaccinate calves.
- Plan C. Vaccinate calves without testing the herd.
- Plan D. Vaccinate adult cattle. This plan is advised only to meet emergency situations.

#### Program Has Broad Application

Most States have adopted the four-point Federal program or some of its provisions with or without modifications. It appears that this Federal program fits most situations: Areas and herds badly infected and those lightly infected; dairy herds under close supervision of owners and beef herds on range; owners who are willing to remove known reactors at once and those for economic reasons who wish to retain them. The man who wants to vaccinate his calves for the protection afforded, and not test, can do so by enrolling under plan C. It seems that almost any cattle owner having an honest desire to free his herd from brucellosis can find the appropriate means for doing so without undue sacrifice, by adopting one of the plans recommended by the U. S. Bureau of Animal Industry.



### Test and Remove Reactors

All States are not operating identical programs to control and eliminate brucellosis. North Carolina, for instance, is at present a modified, certified brucellosis-free State. New Hampshire has gained a similar distinction of achievement. Both of these States, with scattered herds and light initial infection, used plan A, "Test and Slaughter" with reactor indemnities, as their chief plan of elimination. Michigan has cleaned up 43 counties in the northern part of the State by the "test and reactor removal" method. These counties, in general, had few reactors when tested. North Dakota has 12 certified counties. Reactors were removed for slaughter. Indemnity payments were discontinued about 5 years ago.

Plan A most certainly has demonstrated its value as a quick method for eliminating brucellosis in areas and from herds having few reactors to remove. It is quite possible that more States in the future will be adopting the plan A program as the most effective means of removing its last remaining infected animals before final State certification.

### Hold Reactors and Calf Vaccinate

Plan B for brucellosis control is now being widely used. Since reactors may be retained as long as they are profitable producers, no great immediate sacrifice is entailed because of testing the herd. However, the testing does point out the disease status of the herd and, in addition, it points out to the owner the animals that should be removed at the earliest opportunity.

The protective value of calf vaccination is also gained by those electing to follow this plan. This protection of the heifer is highly desirable and essential as long as potential spreaders are being retained on the premises. With the vaccinated heifers growing into cows, the older infected animals are gradually sold to make stable room for them. In about 5 years, after joining plan B, a new herd, all calf-vaccinated, has replaced the former one. Plan B has been used very successfully against brucellosis in New York State, which to begin with contained many infected animals and herds. Today, over 11,000 herds in New York are "certified" under this plan B program of calf vaccination and of gradual reactor removal.

### Plan C, Vaccinate the Calves

The third plan in the Federal program is plan C, calf vaccination without testing. Calf vaccination holds a special appeal to beef men who have cattle on range; that is, when their primary interests is in saving the calf crop from abortion losses. To some cattlemen, blood testing which requires running the animals through a cattle chute is objectionable. However, the average cattleman accepts the vaccination of calves as a desirable and valuable practice under most management conditions.

Dairy herd owners, too, see in plan C a good starting point for brucellosis control and, ultimately, elimination. With each successive lot of vaccinated heifers going into the herds as replacements, a mature herd of vaccinated animals is built up in a relatively few years. This is equally true in beef herds as well. While some delayed reactors are to be expected from calf vaccination, the number is not likely to be large. The vaccination protection afforded, most owners agree, far outweighs the risk of having a few vaccination reactors created.



After the vaccinated herd has been developed under plan C a switch of plans to plan A or B with testing will be the next logical step toward the goal of elimination.

Calf vaccination is not the end in itself but merely a progressive step toward that end. Vaccination alone will never tell when a herd is free of brucellosis, when feeder cattle will be eligible to cross the borders of States that require negative blood tests, or when that milk for the farm family comes from brucellosis-free cows. However, plan C does make a point of beginning and a sound one, too, for the owners of herds believed to have many animals infected. In California and in Colorado, the vaccination of all dairy heifer calves has been made a compulsory practice. Many brucellosis-free herds today, in our intensive cattle areas, started with calf vaccination.

#### Adult Vaccination

Plan D, adult vaccination, has but limited application. Only under extreme circumstance as a means of slowing down an impending "abortion storm" is adult vaccination recommended for use in a herd. Since reactors of considerable duration are created through the vaccination of adult cattle, such vaccination tends to delay the time that these herds will qualify as clean or certified.

In spite of this objection to adult vaccination, some buyers of cattle of unknown origin often insist that their purchased cows be vaccinated before admitting them to their own herds supposedly containing sources of infection. This practice of vaccinating adult dairy replacements appears to be common in California and in Massachusetts in commercial herds. Probably the practice will continue until such times as dairy cows officially vaccinated as calves can be bought.

It is being noted in States, New York for instance, where calf vaccination has been practiced for many years, and the animals in a high proportion of the herds are now calf-vaccinated, that interest in adult vaccination has declined markedly. This trend will probably follow elsewhere as more and more calves each year are vaccinated and as disease exposure becomes less and less a potential hazard. In some States, Idaho for example, adult vaccination is prohibited by law. Some other States allow adult vaccination by permit only where need is indicated. Though the vaccination of adults has official approval under special condition, the practice offers little to recommend it as a long-time procedure for fighting brucellosis. Generally speaking, it is being used because the more satisfactory methods for combating brucellosis were not started earlier.

#### STATE BRUCELLOSIS CONTROL PROGRAMS

Brief mention has already been made of the plans of brucellosis eradication under way in a few States. Let us now review the provisions of a number of States in more detail as examples of how brucellosis is being handled in different areas of the country. As we have said before, there are four major Federal plans: (A) Testing and removal of reactors at once; (B) Testing and retention of reactors accompanied by calf vaccination; (C) calf vaccination; and (D) adult vaccination. The States chosen for discussion illustrate typical methods of eradication procedure. They have not been selected upon the basis of results achieved.

North Carolina: The program in this State has been under way for about 17 years. The chief plan is one of blood testing and the slaughter of all reactors with indemnities. To begin with, the incidence of infection at the start of the program was about 3 percent of the cattle tested. Recent reports show that the rate of infection has declined to 0.26 percent. Of 248,600 cattle tested last year, but 658 reactors were disclosed. North Carolina is the first State to become a Modified-Certified Brucellosis-Free Area.

The program is one of area testing under contract with the county boards of commissioners. All blood drawing is done by State and Federal veterinarians free of cost to cattle owners until the area or county has become "certified." After herds are certified, they are tested annually at the owner's expense by local veterinarians. Both owners and practicing veterinarians are notified from the State office when these annual tests are due.

All reactors are branded and reported to the State officers. Owners may retain their branded reactors if they choose, but the milk from their herds cannot be sold as grade A for fluid consumption if known reactors are being retained. Since the milk from such herds can be sold only for manufacturing purposes at lower prices than for grade A, few reactor cattle after being disclosed are retained in North Carolina. Herds losing their "certified" ratings because of new reactors become eligible for free tests by State and Federal veterinarians until they can be recertified.

Another provision of the North Carolina program is that all cattle offered for public sale must be blood tested and negative prior to sale. Also in this State, rigid health regulations are being enforced on the importation of cattle from other States. It is said that the strict control of all reactors by branding and the prohibition of their sale except for slaughter are basic points in the program's success.

Calf vaccination in North Carolina is not deemed necessary since Brucellosis infection has been reduced to the near-vanishing point. However, it is allowed under special conditions by permit. This is also true of adult vaccination. Only about 1,700 calves and 488 adults were vaccinated in the State last year.

Minnesota: The program in Minnesota is chiefly one of area testing with the reactors being slaughtered. Indemnities are allowed, but with the maximum appraisal set by State law at \$125 for grade cattle and \$225 for purebreds, few indemnities are being paid. Salvage payments usually more than fully cover these restricted appraisal values. Test areas are declared when 67 percent of the cattle owners request testing service.

At present, Minnesota has 35 of its 87 counties doing area work. Most of them are located in the northern part of the State. Eight more counties are in the process of being signed up. All testing in areas is free to cattle owners, being performed by State and Federal veterinarians, local veterinarians, and in summer by some student veterinarians for the veterinary college. Retests of herds showing reactors are usually performed by full-time State or Federal staff veterinarians.



All reactors must be tagged and branded with "B" on the left jaw. They usually go immediately to slaughter. In some cases however, on permit, reactors may be held in quarantine on the owner's premises, but slaughter is eventually required.

Another feature of the Minnesota brucellosis eradication program is the restriction on the sale of cattle not tested for brucellosis. All cattle disposed of at public and private sale must be accompanied by a negative test chart, or in the case of young vaccinated animals, by a certificate of vaccination.

Calf vaccination and adult vaccination are kept under close supervision. Only licensed veterinarians holding permits may administer Strain 19 vaccine. Calves 4 to 8 months old may be vaccinated at the owner's expense provided the calves are identified with the official eartag in the right ear or by a legible tattoo number, and are further identified by tattooing in the right ear, the letter "V" accompanied by date of vaccination. All vaccinated calves must be reported to the State office by the veterinarian. Adult vaccination is allowed under special conditions only.

A new development in Minnesota is the testing of dairy herds by the Ring test or ABR test of the milk. The ring test is being used extensively to retest herds in clean areas. Under the program, these areas are scheduled for retesting every 3 years by the blood agglutination test. Through the application of this milk test, a cheaper method, betweentimes, some infected herds are discovered earlier than they would have been if tested but once in 3 years as formerly.

The ring test is being applied also to herds outside organized testing areas. Milk samples are collected at milk plants, and the tests are run at mobile trailer laboratories moved to the locality. Owners having herds showing possible brucellosis infection are advised to call their local veterinarians and obtain a blood test on the herd. As a result of this supplementary ring testing program outside signed-up areas, much private blood testing is going on in the State at the owner's expense. All reactors, however, on these private tests must be treated the same as reactors in the areas; tagged, branded, and if not slaughtered at once, held in quarantine for later slaughter.

In Minnesota, for the 34 counties completely tested, no brucellosis reactors were found in 89 percent of the herds on the first test, and 97.8 percent of the cattle were negative. Under such conditions of low infection, "test and slaughter" without calf vaccination aid appears to be the logical procedure to follow for quickest eradication results. In the more intensive dairy counties in southern Minnesota, where brucellosis is expected to be more widespread, calfhooed vaccination will be utilized to a greater degree in the future.

#### eradication

New York: The brucellosis program in New York illustrates how a dairy State, with about 15 percent of its cattle infected at the start of the program, has been meeting this situation. The present plan has been developed by trial and error method during the past 20 years. A private program of testing and the recording of "approved herds" developed in the early 1930's. The "test and slaughter" plan with reactor indemnities was begun in 1935 but discontinued largely about 6 or 7 years later when calfhooed vaccination with Strain 19 became approved.



Since 1941, the major procedure for handling brucellosis in this State consists of two plans, plan A and plan B. Plan A is the equivalent of the Federal plan B. It consists of testing, removing or retaining reactors, and vaccinating calves. Plan B in New York is calf vaccination without testing. The official age for calf vaccination is 6 to 12 months, but 6 to 8 months is advised for clean herds and herds working toward a certified status. Adult vaccination, though permitted as a private procedure, is not a part of the official program.

Reactors disclosed on blood tests are not branded or tagged. However, they are identified on the test charts and in the official State records. Buyers of cattle in New York have learned that when making purchases, the safe procedure is to buy only animals that are negative or certified herds. New York pays no indemnities for cattle reacting to blood tests. All services, however, for blood testing and calf vaccination are free to herd owners enrolled in either of the two State plans. Local veterinarians paid by the State or county do the work.

New York does not operate upon the area plan. The services of testing and vaccination are available to all cattle owners regardless of their geographic location. About 81,000 herds are under official supervision. This is approximately 76 percent of all herds in the State. One of the objectives in New York is to vaccinate all heifer calves to be raised as dairy herd replacements, in order to work toward 100 percent calf-vaccinated herds. The second objective is to test these herds, identify the remaining reactors for owner removal, and certify as many of them as possible. These two objectives are being well met. Most calves for commercial herd replacements now are being vaccinated, and over 11,000 herds are certified. In addition, herds that have passed their first qualifying clean test toward certification number many thousands more.

It appears that under New York's conditions of intensive dairying, of large cattle movements, and of relatively high infection at the start of the program, the two-plan program just outlined is serving New York milk producers well in their endeavor to whip this disease. The goal seems to be within sight at this time.

Colorado: This State, like some others, is endeavoring to carry on a program of brucellosis control and eradication under numerous handicaps. In the first place, dairy and beef interests have not agreed upon a unified program applicable to all cattle owners. Secondly, it was said that but \$28,000 had been appropriated annually by the State for brucellosis work. Third, in the entire State of Colorado only 156 veterinarians are registered. Probably only about 100 are doing field practice, a small number for such a large State. In spite of these limitations, brucellosis control is moving ahead.

The Colorado brucellosis program is rather unusual in that it has compulsory provisions in the law applicable to owners of dairy cattle but not to owners of beef cattle. The law requires all dairy heifers between the ages of 6 and 15 months to be vaccinated against brucellosis. Harsh penalties may be applied to dairymen failing to comply with this regulation. For beef calves, vaccination is optional and voluntary. However, many range cattle are being calf-vaccinated. A letter "V" followed by the last numeral of the year in which a calf is vaccinated is tattooed in the right ear except in the case of registered purebreds. This tattoo serves to identify calf-vaccinated animals. All vaccination must be done by, or under the supervision of, a licensed veterinarian.



Blood testing in Colorado is voluntary except for dairy cattle sold at public auctions or by private treaty. All dairy cattle must be blood-tested and negative within 30 days prior to date of sale. However, in cases of vaccinated cattle under 30 months old, blood tests are not required. All reacting dairy-type cattle (and beef cattle reactors from control areas) are tagged and tattooed. They may be held by owners in quarantine, but when released they are branded with "B" on the left jaw and sent to slaughter where Federal or State-approved inspection is maintained.

Worn-out dairy cows may be sold for slaughter without testing provided their status is declared on Form 50, which amounts to receiving a permit for sale from the State veterinarian. Little blood testing goes on in Colorado outside dairy herds. Some area work has been done, but almost none is in progress at present.

It has been mentioned that Colorado greatly lacks veterinary service. Many counties have no veterinarians within their borders. With a compulsory calf-vaccination program for all dairy-type calves in force, this shortage of veterinarians presented a major problem. The State met this by training and approving lay vaccinators, who operated under veterinary supervision to fill the gap. About 36 laymen are serving as calf vaccinators. Their services are available to owners of both beef and dairy cattle.

All brucellosis testing and calf vaccination in Colorado is at the owner's expense, except for the testing of blood samples, which is free at the Federal-State laboratory at the Denver stockyards.

In general, the program in Colorado consists mainly of compulsory vaccination of dairy calves and the blood testing of dairy cows sold for dairy purposes. Few services are provided by the State, other than meeting administration costs, to induce owners of cattle to participate. However, a great many calves, both beef and dairy, are being privately vaccinated under the program. The extensive use of laymen is one of the outstanding features of the plan in this State.

California: Since January 2, 1948, owners of dairy cattle in California have been operating under a compulsory program of female dairy calf vaccination. All vaccine is provided free by the State, and all veterinary service entailed in the vaccination of these calves is paid for from State funds. The responsibility of the dairy cattle owner is to submit his calves for vaccination when they are between 6 and 12 months old and to furnish the veterinarian assistance in handling the animals. Owners are free to call any accredited veterinarian of their choice to vaccinate the calves that they have.

All vaccinated calves are required to be identified by an official tattoo placed in the left ear by the veterinarian performing the service, showing the period within which the calf was vaccinated. It is unlawful in California for dairy cattle owners to refuse to have their calves vaccinated. Penalties are prescribed in the law.

During 1951, 317,000 calves were vaccinated under the program. About 270 accredited veterinarians are being utilized to supply the service. State appropriations for the work approximate \$450,000 annually.



In contrast to the brucellosis programs in many other States it is seen that in California compulsory vaccination of dairy calves is the major feature of the program. Vaccination of beef calves is voluntary, yet many beef calves are being officially vaccinated. California has few brucellosis regulations restricting the importation of cattle from other States.

In general, under this program, considerable brucellosis control progress has been made. With rather heavy infection in most dairy areas of the State at the start, "test and slaughter" obviously was not the right program. The slower, less painful method of calf vaccination seemed to fill the gap as infected cattle were gradually being removed. Right now California appears to be ready for the next forward step in a sound eradication program, that of more blood testing for certification of both beef and dairy herds.

Nebraska: The program in Nebraska is mainly a private one. Though the State law provides for free blood testing on initial tests and for free calf vaccination service, the owners paying for the vaccine, it was said, are receiving little of this free service.

In much of the State, there are few veterinarians. This is particularly true in the Sand Hills region. In areas where there are veterinarians, it was stated that many of them refused to do official State work because the rate of compensation allowed by law, \$15 a day, was unattractive.

The program in the State largely resolves itself into being a private program. Hard owners using veterinarians for blood testing and vaccination pay the private service charges asked. Many cattle owners in the range areas buy their vaccines from the drug stores or biological houses and do the job themselves.

A recent law in Nebraska requires that all brucellosis reactors be branded for identification. This law further discourages range cattlemen from testing their herds, it was pointed out.

#### RETARDING INFLUENCE IN SOME STATES

1. The need to eradicate brucellosis is unfelt as yet.
2. Lack of proper vision to see the goal clearly.
3. Shortage of veterinarians.
4. Shortage of funds to carry on a satisfactory program.
5. Failure of veterinarians and State leaders of the industry in getting together and agreeing upon a program. Too much bickering over details at top levels.
6. The desire to move ahead faster than the cattle owner is ready to move.
7. Too much effort is expended on regulation enforcement and too little on helping producers to get rid of the disease.
8. Many programs appear to be so complicated that the average cattle owner fails to understand them.



SOME BRUCELLOSIS OBSERVATIONS AND RECOMMENDATIONS

1. Brucellosis eradication in varying degrees is moving forward in most States.
2. Splendid cooperative relationships exist between Federal and State sanitary officials, college and Extension Service personnel.
3. Eradication progress is more advanced in dairy areas than in range cattle areas. As yet, beef cattlemen and dairymen do not see eye to eye on the kind of program they both can agree upon to promote in their State.
4. To meet the problem of insufficient veterinary personnel to carry on the program effectively, the use of properly trained laymen for vaccinating and bleeding, preferably under veterinary supervision, offers hopeful possibilities.
5. Veterinarians in private practice must be adequately compensated if their services are to be utilized. The pay rates are too low in some States.
6. Since brucellosis eradication in livestock has a direct bearing upon the control of brucellosis (undulant fever) in human beings, the public agencies of government have a responsibility to assist in the eradication of this disease. Many States and some counties have already accepted this responsibility by appropriating generously of their funds.
7. The ABR or ring test holds much promise of speeding the testing of herds at lower cost in milk-producing areas.
8. Some States have too many program regulations to enforce for which they are not prepared. They lack sufficient policing personnel.
9. In a good many States, the education of livestock producers to the need for eliminating brucellosis has outstripped the means for satisfying this need and desire. In other words, the demand for brucellosis control exceeds the means for supplying it; areas are signed up and still waiting for service.
10. Before final elimination is achieved, rigid controls over the movement of known reactors must be established, but too hasty passage of such regulations should be avoided.
11. Additional educational work is needed in some States. More leading and less forcing by compulsory legislation is suggested. In due time education will succeed in bringing the desired results, and do it less painfully. Folks usually move when they are convinced it is to their advantage to do so, not just because someone says they "ought to" or "must." The "must" method is likely to cause balkiness and resentment, which we see developing in some areas.
12. Calf vaccination should be viewed as a means to an end, and not the end, or goal. Some day, it is hoped, vaccination will be unnecessary and can be dispensed with as disease infection reaches the near-vanishing point as it has done in some States.



13. Brucellosis eradication in swine and other animal species should receive increasing attention as the rate of infection in cattle declines.
14. Brucellosis research in all its related aspects should continue.
15. The day is fast approaching when the shippers of cattle across State lines and the producers of milk must be able to comply with health regulations relating to brucellosis control.
16. Proper management to protect herds against all possible sources of exposure cannot be too greatly emphasized. Those who vaccinate tend to become careless and overlook this rule.

#### MASTITIS CONTROL

It was mentioned earlier in this report that 35 States indicated that mastitis in dairy cattle is a problem. What is being done for its control?

Probably one thing more than any other that most folks agreed upon as I interviewed them is that mastitis will be reasonably well controlled when proper herd management practices on the farm are observed. No one disagreed upon this point. The veterinarian can lend valuable aid in diagnosis. Infusion treatments with drugs have their place. Laboratories for testing milk samples provide useful information for diagnosis, treatment, and research. But on the farm it is the man who manages the herd and milks the cows upon whose shoulders the control of mastitis principally rests. It is upon the numerous phases of herd management that emphasis is being placed almost everywhere that mastitis is a problem.

#### The Florida Program

In Florida a rather unusual mastitis control plan is in operation. It is fully supported and managed by the State without cost to dairy cattle owners.

Florida has many large milk-producing herds in the vicinity of the big markets such as Miami, Tampa, and Jacksonville. In these herds with many purchased replacements and with hired help, mastitis has been a costly disease. The State is attempting to reduce these losses.

Under the Florida plan, which comes under the direction of Dr. J. V. Knapp, secretary of the Florida Livestock Sanitary Board at Tallahassee, 16 mastitis-control supervisors have been employed. Dr. A. A. McMurray, at Lakeland, is field supervisor. These employed men are all college graduates trained in dairy production and herd management. According to the plan, these supervisors, assigned to different milk-producing areas, visit the farms of cooperators about every 2 weeks to check upon the management practices in use after control programs for the herd have been laid out. Milking equipment and milking procedures are closely scrutinized. Sanitation is observed, and all conditions that may contribute to the increase of teat and udder injuries are watched for. Examining cows and their treatment are left to local veterinarians who work closely with herd owners and supervisors on the project.



It is stated that this subsidized program in Florida is bringing results. Better herd management and better milking procedures are basic items in the plan. In other words, "prevention" is the watchword. Where failure is reported, it is usually in herds where the farm labor turn-over is high. In owner-managed herds, the results have been satisfactory. It will be interesting to observe the Florida Mastitis Control Program as it continues.

### The New York Plan

About 5 years ago, New York received a special appropriation of \$75,000 to set up a mastitis-control program. Six regional laboratories were established, at Ithaca, Kingston, Earlville, Farmingdale, Canton, and East Aurora. Each laboratory is under the management of a veterinarian. Dr. H. G. Hedges, of the New York State Veterinary College at Cornell, is State field supervisor. Research and demonstration were the first objectives. Service at that time was secondary.

Under the New York program, local veterinarians are encouraged to cooperate. The Extension Service plays an important role in project organization and in mastitis-control education. The local practitioner helps laboratory veterinarians with herd surveys, in laying out individual farm control plans, and with the treatment of infected cows. The services of the field laboratory for testing milk samples and the supervising help and advice of the laboratory veterinarian are free to herd owners. The farmer pays his local veterinarian for the services which he provides.

These laboratories in New York are not set up to give wholesale milk-testing service to farmers on a lot of miscellaneous milk samples which they may bring or send in. In general, the laboratories test only the samples from herds that are endeavoring to carry on a mastitis-control program with the help of their local practitioner. Practically all milk samples tested are those taken by veterinarians and not farmers. The farmer and the veterinarian use the results of these tests for diagnosis, treatment, and as a basis for control practices.

As in Florida and in many other States, New York places great emphasis upon good milking and right herd management. Injuries to teats and udders are recognized as a major contributing cause of mastitis. The raising of one's own replacements is another recommendation. Treatments without good management to accompany them are doomed to give poor results, the New York work has demonstrated.

The Extension Service in New York is taking a very active part in the over-all program. Much publicity and many meetings and demonstrations are held to induce farmers to prevent mastitis. The results are encouraging as dairymen learn the facts and put them into practice. An effort is being put forth to have more herd owners utilize the services of their veterinarians and these laboratories.



### TUBERCULOSIS

While all may not agree with this statement, it is the opinion of many livestock authorities and health people that the near-elimination of tuberculosis in the cattle population of the United States has been one of the great forward steps of livestock progress of our age. Today, the average national incidence of infection is but 0.19 percent, according to 9,439,811 tests for the past year. Only 17,733 reactors were revealed. So low has the infection rate dropped that the chief danger from tuberculosis now is that livestock owners and the public at large will become so complacent that continued eradication efforts will be relaxed. In some States, this trend is being noted.

It is the recommendation of the U. S. Bureau of Animal Industry and the U. S. Livestock Sanitary Association that all areas except range or semiarid areas, to remain accredited must have all cattle tested at intervals not to exceed 6 years. Most States are endeavoring to abide by this policy. However, it was learned that in a few States the tuberculin testing of all herds and all cattle according to this 6-year plan is not being achieved, principally because of insufficient veterinary personnel to do the physical work. "Spot testing" has been resorted to. In many States few accredited herds are being maintained because of infrequent testing.

While the chief object is to keep tuberculosis subdued, the testing of all herds at intervals of not to exceed 6 years seems liberal enough, as most livestock leaders are agreed. In some cases, I was informed, there are cows 10 years old that fail to carry a tuberculosis test tag, and it is not because the tag came out and was lost. Of course, this is not the rule but the exception. The point to be made, however, is that tuberculosis in this country must never again be allowed to gain a foothold, as it did 30 years ago. Cattle owners should not take the view that tuberculosis is gone. The finding of 17,000 reactor cattle on the tests applied, presents vivid evidence that tuberculosis is still here. Extension workers, veterinarians, and leaders of the livestock industry must be ever alert to correct any impression that testing may stop.

The recent policy of the U. S. Bureau of Animal Industry, Meat Inspection Division, of reporting back to the State of origin all animals slaughtered showing tuberculosis lesions has been an aid in tracing and stopping potential outbreaks in some localities. From what I learned, this new move to stop tuberculosis before it has time to spread widely is being well observed in virtually all States visited. Some pockets of infection have been found that might not have been discovered for 6 years or even longer under the regular testing or "spot-testing" procedure.

In summary, the Extension Service and the Bureau of Animal Industry have the obligation of pointing out to cattle owners that the tuberculin testing of herds must still go on. Tuberculosis in poultry and hogs is a sidelight of the over-all issue that requires continued attention in some of the Midwestern States.

### PROGRAM OBSERVATIONS AND RECOMMENDATIONS

1. Almost all States are carrying on extension work leading toward healthier flocks and herds.
2. State livestock health educational activities revolve mainly about the major problems affecting health, production, and profits.
3. The human health aspects of livestock disease are receiving considerable emphasis in some States, particularly brucellosis.
4. Much attention by the Extension Service is devoted to the strengthening of working relationships with veterinarians and with State and Federal sanitary officials. Generally, these relationships are usually good; friendly and cordial.
5. In many States the Extension Service is looked to, to provide leadership as well as to supply educational information on livestock health problems and programs.
6. Disease prevention is the major area in which the extension worker operates in the conduct of his program.
7. The help and advice of livestock industry committees in program planning are being greatly relied upon.
8. The local veterinarian is being drawn upon more and more as an active participant in this educational work of Extension.
9. Treatment of disease problems, with the exception of emergency first aid, is recognized as being outside the field of the extension dairy and livestock specialist. It is a veterinarian's job.
10. Often where weak livestock health programs are recorded, a lack of sufficient specialist help is a contributing cause.
11. In some instances, county programs are weak because State programs are weak, because of slight interest in health on the part of specialists and State county agent leaders.
12. Some States are doing a better livestock health job than their filed annual reports indicate.

### A Suggested Health Program

After this review and study of many State programs prepared by specialists, a composite program outline is herewith presented, general as it may be. Adapted to any State, the situation, objectives or goals, and plan of work must necessarily be based upon local problems and needs. As an outline, however, the following may serve as a useful guide.



**Situation:** Success with farm livestock production in large measure depends upon healthy animals. Human health, too, in some respects is associated with the health of the animals with which people have contact and from which their food is derived. At present, brucellosis in human beings, and in cattle, goats, and hogs, is a problem of national concern. How to guard against these diseases transmissible to man, and many others that cost the vast livestock industry staggering losses, is the cooperative responsibility of livestock owners, veterinarians, and public agencies, Federal, State, and local.

Another aspect of livestock health that has current significance is its relation to national defense. All factors hampering food production must be removed. Farmers and ranchers should be ever vigilant to recognize evidence of new diseases and to report it immediately to their veterinarians or to State sanitary officials. Foot-and-mouth disease still remains as a potent threat. All livestock interests must be kept constantly aware of the need to keep farm livestock healthy and disease-protected.

**Objectives:**

1. To protect the livestock industry against disease losses; to extend profitable animal life, of dairy cows in particular.
2. To protect human health against livestock maladies transmissible to man, especially brucellosis.
3. As a national defense measure, to guard the country's food and fiber supplies against all nature of loss, especially livestock diseases and parasites.
4. To make livestock owners more conscious of the high values to be reaped from animal health protection through disease-prevention practices.
5. To control and eliminate the following problems: (List them for your State).

**Plan of Work:**

1. Assist county agents and county committees with program planning based upon local problems and needs.
2. Provide help and leadership as requested in organizing livestock health programs such as for brucellosis area work.
3. Prepare publicity material:
  - a. Press releases.
  - b. Radio talks.
  - c. Bulletins and leaflets.
  - d. Circular letters.
4. Hold meetings, tours, and demonstrations as planned and arranged by county extension agents.



5. Work hand in hand with local veterinarians in the promotion of livestock health.
6. Cooperate fully with State and Federal livestock sanitary officials on the programs of disease control and eradication under way or being planned.
7. Encourage research upon field problems needing attention.
8. Emphasize in this livestock health program of education the importance of:
  - a. Proper feeding.
  - b. Right housing.
  - c. Rigid sanitation.
  - d. Careful selection (inheritance).
  - e. Good management.
  - f. Disease prevention and control.
9. Since the field of public livestock health is a broad one, cultivate cordial, cooperative, working relationships between all parties having a direct interest.
  - a. Livestock industry committees.
  - b. Boards of health.
  - c. Veterinary societies.
  - d. Vocational agricultural teachers.
  - e. Others.

#### SUMMARY

A survey of extension dairy and livestock specialists' reports and plans of work, and visits to 24 States, indicate that keeping farm livestock healthy is a major phase of the Extension Service program in virtually all States. Education relative to the needs for healthy flocks and herds and the management practices required, is being widely emphasized. Meetings, demonstrations, circular letters, bulletins, pamphlets, leaflets, exhibits, and radio releases are the methods employed to reach people.

Programs to control and eliminate specific diseases and parasites are formulated and promoted with the assistance of veterinarians, research workers, and Federal and State sanitary officials. The Extension Service at all levels, Federal, State, and county, provides a trusted and competent leadership in this important field of livestock health. The profit of producers is at stake when livestock disease begins to extract its toll. The health of human beings can be menaced. The food supply of the Nation -- meat, milk, and eggs -- can be jeopardized if livestock diseases and parasites on the loose are allowed to go unnoticed and unmastered.

A heartening observance in this study of livestock health programs in different States is the friendly and cordial working relationship and cooperative spirit existing among those close to the field. Bureau of Animal Industry inspectors and State veterinarians spoke highly of the help received from college specialists and county agents on brucellosis control and other projects. Home



economics specialists were credited also with lending valuable aid to convince homemakers that for family health protection, brucellosis must go.

In all States, the elimination of brucellosis in farm animals is viewed as one of the major problems and projects at this time. This report devotes considerable space to a review of the various State programs. Though all have some similar features based upon the nature of the disease to be controlled, wide variations in methods from State to State are apparent. Local conditions have had a great influence upon the type of program in force. Many of these factors are mentioned, such as class of livestock, beef and dairy; incidence of infection; and funds appropriated and personnel available for blood testing and calf vaccination. Regardless of these State program differences, progress is being recorded in varying degrees almost everywhere.

Mastitis control centers on practices of prevention, with veterinarians giving assistance on diagnosis and treatment. The Florida plan stresses proper milking and good management practices. The New York program adds laboratory diagnosis as a recommended aid. The Extension Service plays a very important role in all the educational work going on to help dairy farmers cut their losses from this dairy cattle problem.

Of the other diseases and ailments, including parasites, that cause livestock losses, many of the most serious are mentioned in State programs. There are the internal and external parasites of the South which are particularly costly. The range country has its nutrition problem. The Corn Belt is plagued with hog cholera, swine erysipelas, and atrophic rhinitis.

Johne's disease, anaplasmosis, listerellosis, Q-fever, brisket disease, X-disease, vascular exanthema, anthrax, blackleg, leptospirosis, vibrio fetus, not to leave out breeding troubles and sterility, are all listed in one or more extension reports as receiving attention. The point is, the Extension Service and its cooperating agencies are alert to the task of keeping livestock farmers informed of the livestock health problems to look out for, to prevent and control. Research, too, received Extension Service impetus and encouragement with the results of its findings carried afield for practice and use. The livestock industry is being well served by competent men.

Keeping farm livestock healthy will remain, like proper feeding, careful selection and breeding, and farm record keeping, an integral part of the good farmers' program. This study more than before impresses us with this fact. The chief problem encountered is one of insufficient veterinary and extension personnel to do the numerous jobs awaiting to be done.

We trust that others may be able to carry on from where this study leaves off.

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of infection; and finally emphasized and summarized in a table for quick reading  
and quick consultation. A summary of a large State program is presented,  
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Health control depends on treatment of individual, with vaccination giving  
assistance in diagnosis and treatment. The Florida plan stresses proper  
milking and good management practices. The New York program adds laboratory  
diagnosis as a recommended aid. The Wisconsin Service gives a very important  
role in all the educational work done on the dairy farms and their  
losses from this dairy cattle program.

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personnel to do the necessary jobs required to be done.

We hope that others may be able to carry on from where this study leaves off.